Chapter III
PROCEDURE

Conventional skill tests and test batteries were in common use to measure the skill level of all levels of players, without giving due consideration to the type of skill level possessed by different players in different games and sports.

The purpose of this study was to find an answer to the above question. An attempt has been made to provide need dimensions to the field of measurement and evaluation. On the basis of the doctrine of "Objectivity", the researcher has tried to identify and construct specific skill test items to measure the playing ability of soccer players objectively.

This chapter includes the selection of subjects, identification and selection of test items, criterion measure, instruments' reliability, collection of data, administration of test items, development of the test battery and statistical analysis of the data.
Selection of Subjects

For the construction of Soccer Playing Ability Test, 108 Soccer players, age ranging between 15 to 19 years, who were adopted by Sports Authority of India (SAI) at different hostels of Eastern Region (Kolkata) and North-Eastern Region (Imphal and Guwahati), were taken as the subjects of this study. The study was conducted only on male players.

Identification and Selection of Test Items

Every possible care has been taken to select tentative test items, which most closely relate to approximate the actual playing characteristics of the game of soccer. Since the researcher himself not only specialised in soccer in his graduate and post-graduate degrees but also participated as a player in many competitions at different levels, the first step adopted by him was personal observation of the game with a specific purpose. It was observed that the game of soccer involves the following fundamental skills:
1. Dribbling
2. Kicking - (a) Passing  
   (b) Shooting 
3. Receiving 
4. Heading 
5. Feinting 
6. Tackling 
7. Ball Sense.

Apart from personal observation, the researcher has gone through the related literatures (library and Internet), various test and measurement books and watching different levels of soccer matches on live as well as television, to acquaint himself with the procedures of the test construction.

The researcher also personally met with some National Soccer Coaches, SAI Soccer Coaches and State Soccer Coaches, to seek their expert opinions and suggestions.

After a long discussion and critical analysis with the above mentioned experts, the possibility of 44 specific skill test items were
identified, and thereafter the methods of their evaluation were devised. A list of 44 initial skill test items was framed which could approximately measure the specific skill ability of the soccer players.

**Trial Run**

For further development and setting of all the 44 test items into appropriate manner, a trial run of all the skill test items was conducted on 11 (eleven) soccer players of Lakshmibai National Institute of Physical Education, Gwalior.

**Finalization of Skill Test Items**

After the trial run, for the final selection of skill test items, all the 44 initial test items with their detail description and diagrams were distributed to three experts, who have the knowledge of soccer and research works. The experts were requested to select the most appropriate skill test items for the study. Further they were also requested to suggest some more suitable test items. As suggested by
these experts, 32 test items, shown in Table 1, were selected as the final skill test items.

Table 1

LIST OF SKILL TEST ITEMS

<table>
<thead>
<tr>
<th>Category</th>
<th>Item No.</th>
<th>Name of Test Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dribbling</td>
<td>1.</td>
<td>Shuttle Dribbling</td>
</tr>
<tr>
<td></td>
<td>2.</td>
<td>WM Dribbling</td>
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<tr>
<td></td>
<td>3.</td>
<td>30-yard Dribbling</td>
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<td></td>
<td>4.</td>
<td>40-yard Dribbling</td>
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<td></td>
<td>5.</td>
<td>Figure &quot;8&quot; dribbling</td>
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<tr>
<td></td>
<td>6.</td>
<td>Dribbling against the opponent</td>
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<tr>
<td></td>
<td>7.</td>
<td>Ground pass a stationary ball (15 yds)</td>
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<tr>
<td></td>
<td>8.</td>
<td>Ground pass a stationary ball (20 yds)</td>
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<tr>
<td></td>
<td>9.</td>
<td>Dribbling and Ground pass (15 yds)</td>
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<tr>
<td></td>
<td>10.</td>
<td>Dribbling and Ground pass (20 yds)</td>
</tr>
<tr>
<td></td>
<td>11.</td>
<td>Aerial pass a stationary ball (20 yds)</td>
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<tr>
<td></td>
<td>12.</td>
<td>Aerial pass a stationary ball (25 yds)</td>
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<tr>
<td></td>
<td>13.</td>
<td>Dribbling and aerial pass (20 yds)</td>
</tr>
<tr>
<td></td>
<td>14.</td>
<td>Dribbling and aerial pass (25 yds)</td>
</tr>
<tr>
<td></td>
<td>15.</td>
<td>Kicking a stationary ball for distance</td>
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<tr>
<td></td>
<td>16.</td>
<td>Dribbling and kicking for distance</td>
</tr>
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Table 1 (Contd.)

<table>
<thead>
<tr>
<th>Category</th>
<th>Item No.</th>
<th>Name of Test Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shooting</td>
<td>17.</td>
<td>Shooting a stationary ball in the goal (20 yds)</td>
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<tr>
<td></td>
<td>18.</td>
<td>Shooting a stationary ball in the goal (25 yds)</td>
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<tr>
<td></td>
<td>19.</td>
<td>Dribbling &amp; shooting in the goal (20 yds)</td>
</tr>
<tr>
<td></td>
<td>20.</td>
<td>Dribbling and shooting in the goal (25 yds)</td>
</tr>
<tr>
<td></td>
<td>21.</td>
<td>Receiving the ball with chest</td>
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<tr>
<td></td>
<td>22.</td>
<td>Receiving a rolling ball with foot</td>
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<td></td>
<td>23.</td>
<td>Receiving a bouncing ball with sole of the foot</td>
</tr>
<tr>
<td></td>
<td>24.</td>
<td>Receiving an aerial ball with foot</td>
</tr>
<tr>
<td></td>
<td>25.</td>
<td>Heading for distance</td>
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<tr>
<td></td>
<td>26.</td>
<td>Heading for accuracy (10 yds)</td>
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<tr>
<td></td>
<td>27.</td>
<td>Heading for accuracy (12 yds)</td>
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<tr>
<td></td>
<td>28.</td>
<td>Feinting between flags</td>
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<tr>
<td></td>
<td>29.</td>
<td>Tackling &quot;one v/s one&quot; in limited area</td>
</tr>
<tr>
<td>Tackling</td>
<td>30.</td>
<td>Juggling</td>
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<tr>
<td></td>
<td>31.</td>
<td>Repeated wall rebounds (5 ft)</td>
</tr>
<tr>
<td>Ball Sense</td>
<td>32.</td>
<td>Repeated wall rebounds (7 ft)</td>
</tr>
</tbody>
</table>

Most of the test items decided by the experts were believed to be commonly used by most of the coaches as their own crude method of evaluation for skill achieved by players undergoing training under them.
Criterion Measures

The following criterion measures were chosen for the administration of skill tests for constructing Soccer Playing Ability Test on soccer players:

1. Dribbling – All the dribbling tests were recorded in 1/100th of a second and performance was measured by using the formula \( \frac{d}{t} \) (distance upon time) except dribbling against the opponent, which was recorded in number of points.

2. Passing and kicking- All the passing skill tests were recorded in number of points and kicking for distance was recorded in yards.

3. Shooting – All the shooting skill tests were recorded in number of points.

4. Receiving - All the receiving skill tests were recorded in number of points.

5. Heading - The tests of heading for accuracy were recorded in number of points and heading for distance was measured in metres.
6. Feinting - The skill test of feinting was recorded in $1/100$th of a second and performance was measured by using the formula $d/t$ (distance upon time).

7. Tackling - The tackling ability test was recorded in number of points.

8. Ball Sense – All the ball sense ability tests were recorded in number of points.

**Instruments’ Reliability**

The $1/100$th second calibrated stopwatches (Casio) were used in this study for measuring the performance of the players and standardized calibrated synthetic tape (Freemans) was also used for marking the required testing area of the study. All these instruments were hired from Sports Store and Research Laboratory of Lakshmibai National Institute of Physical Education, Gwalior which were purchased from well-known manufacturers catering to the need of research laboratories, and also accepted to be accurate and reliable enough for the purpose of the study.
Data Collection

For the purpose of the study, eight Sports Training Centres (STC) of SAI Eastern Region, Calcutta and SAI North Eastern Region Imphal and Guwahati were selected as the study centres. The eight SAI centres are –

1. STC Guwahati
2. STC Shillong
3. STC Golaghat
4. STC Dimapur
5. STC Imphal
6. STC Kolkata
7. STC Silliguri
8. NSTC Kolkata

The data of the study were collected in two methods i.e. playing ability and skill tests.

The playing ability of those players belonging to 4 centres namely STC Guwahati, STC Golaghat, STC Shillong and STC Dimapur were judged independently by 3 experts when they were
participating in “Gajen Kumai Memorial Inter-SAI Scheme Football Tournament” 2000-2001 held at Sonapur (Assam) and the playing ability of the players of remaining 4 teams i.e. STC Imphal, STC Kolkata, STC Silliguri and NSTC Kolkata were also judged independently by the same 3 experts when they were participating in “Gajen Kumai Memorial Inter-SAI Scheme Football Tournament” 2001-2002 held at Dhing, Nowgong (Assam). Total of 118 players’ playing ability was judged by the same 3 experts. There were 14 players from STC Guwahati, 14 from STC Golaghat, 14 from STC Shillong, 14 from STC Dimapur, 14 from STC Imphal, 16 from STC Kolkata, 14 from STC Silliguri and 15 from NSTC Kolkata.

The data on skill test for the first four teams were collected during the month of February, March and April 2001. And for the remaining four teams, the data was collected during the month of January, February and March 2002. All the 32 skill test items were administered to the players at their respective training centres. To avoid the players from facing fatigue and monotony, all the test items were conducted on 7 to 8 consecutive days in two sessions i.e.
morning and evening sessions. For the morning session the test were conducted from 6.00 am to 8.30 am and for evening session it was conducted from 3.00 pm to 6.00 p.m.

For getting the better results, the purpose of the study was explained to all the players in detail. The demonstration of each test item was given and explained one by one. The doubts were cleared on the spot. An assurance of full co-operation was also sought and got from the players. The subjects appeared in the test in full soccer playing kit i.e. boot, shin-guard, stockings, shorts and T-shirts.

Total of 118 players had participated in skill tests. They were 14 from STC Guwahati, 14 from STC Golaghat, 13 from STC Shillong, 13 from STC Dimapur, 15 from STC Imphal, 16 from STC Kolkata, 15 from STC Shilliguri and 16 from NSTC Kolkata.

The data of those only players, who had participated or completed both the playing ability test and skill tests, were taken as the data of the study. So, the total of 108 players participated and completed both playing ability and skill tests, were taken as the
subjects and their performance were considered as the data of the study.

**Administration of the Test Items**

1. Shuttle Dribbling

**Purpose:** To measure the agility in dribbling.

**Facilities and Equipments:** Stopwatch, 5 Flag Posts, Soccer Balls and marking for the test.

**Procedure:** Two lines parallel to each other are marked on the floor 10 yards apart as Starting line and Turning line as shown in Fig. 1.

At the command "go", the subject was asked to dribble a ball from behind the Starting Line towards the Turning Line and to dribble back to the Starting Line and continues for another round so that he shuttle with dribbling the ball for two rounds. The time from the command "go" till the subject crossed the Finishing Line after two rounds was recorded.
Instruction: If the ball went out of control, the subject was asked to retrieve the ball and continue from there. If the subject committed takes (not crossing the line while turning), the trial was repeated.

Turning Line

10 yds

Starting Line & Finishing Line

Fig. 1. Shuttle Dribbling
Instruction: - If the ball went out of control, the subject was asked to retrieve the ball and continue from there. If the subject committed mistakes (not crossing the line while turning), the trial was repeated again.

Scoring: - The best timing of 3 trials, recorded in the $\frac{1}{100}$ of a second. Further, the divisions of distance of this test item and best timing ($d_i$), was taken as the score of this test.

2. W.M. Figure Dribbling

Purpose: - To measure agility in dribbling.

Facilities and Equipments: - 6 Flag Posts, Soccer Balls, Stopwatch, and marking for the test.

Procedure: - Six flag posts were placed on six stations A, B, C, D, E and F, as shown in the Fig. 2. The running path was in the shape of ‘WM’. The subject took his starting position at the station A.

At the command “go”, the subject was asked to dribble a ball around the flags B, C, D, E and F, then dribble back to take around the flag posts in reverse order.
Instruction: If the ball went out of control, the subject was asked to retrieve it and continue from there itself.

Scoring: The score is the time taken from the command "go" till the player crossed the station line. The best timing of 3 trials, recorded in tenths of a second, was taken as the score of this test.

Fig. 2. W.M. Dribbling
**Instruction:** - If the ball went out of control, the subject was asked to retrieve it and continue from there itself.

**Scoring:** - The score was the time taken from the command “go” till the player crossed the station ‘A’ after finishing the course. The best timing of 3 trials, recorded in the $\frac{1}{100}$th of a second. Further, the divisions of distance of this test item and best timing ($\frac{d}{4}$), was taken as the score of this test.

**3. 30-yard Dribbling**

**Purpose:** - To measure speed in dribbling.

**Facilities and Equipments:** - Stopwatch, Soccer Balls and marking for the test.

**Procedure:** - A Starting Line and a Finishing Line with 30 yards distance in between were marked. A minimum of 2 subjects was tested at a time. The subjects were permitted to take standing start with the ball. At the command “go”, the subject was asked to dribble the ball to cover the distance of 30 yards in the shortest time. The subject was run as fast as he can, across the Finishing Line.
Instruction: - The subject was asked to touch the ball at least 4 times during the course, otherwise the trial was repeated again.

Scoring: - The timing from the starting signal till the subject and ball crossed the Finishing Line was recorded in 1/100th of a second. Further, the divisions of distance of this test item and best timing (\(\frac{4}{1}\)), was taken as the score of this test.

4. 40-yard Dribbling

Same as Test No. 3. (30-yard dribbling). But here, the running distance was 40 yards.

5. Figure "8" Dribbling

Purpose: - To measure ability of controlling the ball with feet during dribbling the ball.

Facilities and Equipments: - 5 Flag Posts, Soccer Balls, Stopwatch and marking for the test.

Procedure: - A Starting Line was marked and 5 flag posts were fixed in a straight line with 3 yards distance in between. The line of flag posts was perpendicular to the Starting Line, which is shown in Fig. 3.
On the signal "go", the subject was asked to dribble the ball from the Starting Line to the right and left of the flag posts alternately. But he was asked to turn around the last flag and return back in the same manner till he crossed the Starting Line as shown in Fig. 3. Each subject was timed and given 3 trials to get the best time.

**Instruction:** If the ball went out of contact, the subject was asked to retrieve it and continue from where it left. If the subject missed any of the flag posts, the trial was repeated again.

**Score:** The best timing of 3 trials was recorded. Further, the divisions of distance of this test item and best timing ("x") was taken as the score of this test.

6. **Dribbling Against the Opponent**

**Purpose:** To measure ability of keeping the ball under control during dribbling against the opponent.

**Facilities and Equipment:** Soccer Ball, Stopwatch and marking for the test.

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Fig. 3. Figure '8' Dribbling
On the signal "go", the subject was asked to dribble the ball from the Starting Line to the right and left of the flag posts alternately. But he was asked to turn around the last flag and returned back in the same manner till he crossed the Starting Line as shown in Fig. 3. Each subject was timed and given 3 trials to get the best time.

**Instruction:** - If the ball went out of control the subject was asked to retrieve it and continue from there itself. If the subject missed any of the flag posts, the trial was repeated again.

**Scoring:** - The best timing of 3 trials, recorded in the $\frac{1}{100}$th of a second. Further, the divisions of distance of this test item and best timing ($t$), was taken as the score of this test.

6. **Dribbling Against the Opponent**

**Purpose:** - To measure ability of keeping the ball under control during dribbling against the opponent.

**Facilities and Equipments:** - Soccer Balls, Stopwatch and marking for the test.
Procedure: A 15 yards wide and 20 yards long rectangular court was drawn as shown in Fig. 4. The attacker (subject) was asked to stand with a ball on the Starting Line and the defender was on or behind the End Line before starting the test.

At the starting whistle, the attacker was asked to move inside the court with a ball. Simultaneously the defender was also asked to move towards the attacker inside the court. The task of the attacker was to dribble past the defender within the court and cross the finishing line with the ball, within 30 seconds. Whereas, the task of the defender was to foil the attempt of the attacker and put the ball outside the court. 10 trials were given to each attacker with different opponents (defenders).

Scoring: One point was given to the subject, if he crossed the End Line with the ball within 30 seconds. The total point for ten trials was taken as the score of the subject.

Fig. 4. Dribbling Against the Opponent & One Vs One in Limited Area
Procedure: - A 15 yards wide and 20 yards long rectangular court was drawn as shown in the Fig. 4. The attacker (subject) was asked to stand with a ball on the Starting Line and the defender was on or behind the End Line before starting the test.

At the starting whistle, the attacker was asked to move inside the court with a ball. Simultaneously the defender was also asked to move towards the attacker inside the court. The task of the attacker was to dribble past the defender within the court and cross the finishing line with the ball, within 30 seconds. Whereas, the task of the defender was to foil the attempt of the attacker and put the ball outside the court. 10 trials were given to each attacker with different opponents (defenders).

Scoring: - One point was given to the subject, if he crossed the End Line with the ball within 30 seconds. The total point for ten trials was taken as the score of the subject.
7. Ground Pass a Stationary Ball (15 yards)

**Purpose:** - To measure the ability of passing the ball accurately.

**Facilities and Equipments:** - Soccer balls, 10 Flag posts and marking for the test.

**Procedure:** - 10 flag posts were fixed in a straight line as the target. The distance between the two middle flag posts was 1 yard. The remaining 8 flag posts were fixed equally on either side of the two middle flag posts with a gap of 0.50 yard in between. 15 yards away and opposite to the middle flag posts, a line was marked from where the balls was kicked towards the target as shown in Fig. 5.

To start the test, the subject was asked to kick the ball, lying on the line, towards the target along the ground. The subject was permitted to use any part of his foot. 10 trials were given to the subject.

**Instruction:** - If, the ball did not pass inside the target zone, 0 point was given to the subject. Only, the ball rolled along the ground was counted.
Scoring: If the points were given according to the area where the ball passed through as shown in Fig. 5. The ball hit any of the flag posts, the additional higher point was given. The total point of 10 trials takes as the score of the subject.

1 pt. 2 pts. 3 pts. 4 pts. 5 pts. 4 pts. 3 pts. 2 pts. 1 pt.

15 and 20 yards

Passing Line

Fig. 5. Ground Pass for Accuracy

Same as Test No. 7, but in this test, the passing distance was 20 yards.

9. Dribbling and Ground Pass (15 yards)

Same as Test No. 7, but in this test, dribbling of 2 to 3 yards precedes the passing.

10. Dribbling and Ground Pass (20 yards)

Same as Test No. 7, but in this test, before passing, the ball was dribbled for 2 to 3 yards and the passing distance was 20 yards.
Scoring: If, the points were given according to the area where the ball passed through as shown in Fig. 5. The ball hit any of the flag posts, the adjacent higher point was given. The total point of 10 trials was taken as the score of the subject.

8. Ground Pass a Stationary Ball (20 yards)

Same as Test No. 7, but in this test, the passing distance was 20 yards.

9. Dribbling and Ground Pass (15 yards)

Same as Test No. 7, but in this test, dribbling of 2 to 3 yards precedes the passing.

10. Dribbling and Ground Pass (20 yards)

Same as Test No. 7, but in this test, before passing, the ball was dribbled for 2 to 3 yards and the passing distance was 20 yards.
11. Aerial Pass a Stationary Ball (20 yards)

**Purpose:** To measure the ability of passing the ball accurately.

**Facilities and Equipments:** Soccer Balls and marking of the test.

**Procedure:** Three different size circles of 5 yards, 4 yards and 3 yards diameter with a common centre was drawn on the ground. At the centre of these three circles a flag posts was fixed so that the circles can be seen from a distant place. The area covered by the outer circle made the target of this test. 20 yards away from the centre of this circle, a line or mark was made as Kicking Zone as shown in Fig. 6.

To start the test, the subject was asked to put a ball in the kicking zone and kick the ball to the target. The ball must be kicked in the air. Like this he was given 10 kicks.

**Instruction:** The ball can be kept in either rolling or stationary. Points were given only when the ball landed inside or on these circles directly.

**Scoring:** 3 different points as 5, 3 and 1 were given according to the place where the ball landed. Ball landed inside the inner circle including the circle line - 5 points, ball landed on the middle circle
12. Aerial Pass a Stationary ball (25 yards)
Same as Test No. 11, but the passing distance was 25 yards in this test.

13. Dribbling and Aerial Pass (20 yards)
Same as Test No. 11, but in this test, before passing, the ball was dribbled for 2 to 3 yards.

14. Dribbling and Pass (25 yards)
Same as Test No. 11, but in this test, before passing, the ball was dribbled for 2 to 3 yards and the passing distance was 25 yards.

15. Kicking a Stationary Ball for Distance
Purpose: To measure distance clearance ability

Fig. 6. Ariel Pass for Accuracy

Inner Circle = 3 yds diameter
Middle Circle = 4 yds diameter
Outer Circle = 5 yds diameter

Kicking Zone
(Ariel pass for Accuracy)
including the circle line – 3 points and ball landed on the outer circle
including the circle line – 1 point was given. The total point for 10 trials was taken as the score of the subject.

12. Aerial Pass a Stationary Ball (25 yards)

Same as Test No. 11, but the passing distance was 25 yards in this test.

13. Dribbling and Aerial Pass (20 yards)

Same as Test No. 11, but in this test, before passing, the ball was dribbled for 2 to 3 yards.

14. Dribbling and Aerial Pass (25 yards)

Same as Test No. 11, but in this test, before passing, the ball was dribbled for 2 to 3 yards and the passing distance was 25 yards.

15. Kicking a Stationary Ball for Distance

Purpose: - To measure power in kicking or long distance clearance ability.
Facilities and Equipments: - Soccer Balls. Measuring Tape and markings for the test.

Procedure: - A restraining line was drawn on one end of the ground as shown in Fig. 7.

To start the test, the subject was asked to put or rolled or bounce a ball behind or on the restraining line. After that, he was asked to kick the ball as far as he can. The distance between the restraining line and the spot where the ball landed was measured. The subject was permitted to use any part of his foot. 3 trials were given.

Scoring: - The distance between the restraining line and the spot where the ball landed was measured in the nearest yards and the best performance of 3 trials was recorded as the score of the subject.

16. Dribbling and Kicking for Distance

Same as Test No. 15, but in this test, before kicking, the ball was dribbled for 3 to 4 yards.
<table>
<thead>
<tr>
<th>Distance</th>
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<tbody>
<tr>
<td>80 yards</td>
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<tr>
<td>10 yards</td>
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<tr>
<td>5 yards</td>
</tr>
</tbody>
</table>

Kicking Line

Fig. 7. Kicking for Distance
17. Shooting a Stationary Ball in the Goal (20 yards)

**Purpose:** To measure the accuracy of shooting the ball in the goal.

**Facilities and Equipments:** Soccer Balls, Soccer goal (Goal Posts) and Rope.

**Procedure:** The whole goal was divided by rope into 7 parts as shown in Fig. 8. Outside the penalty area a Shooting Arc was drawn. This arc was made with a distance of 20 yards in the extension of approximately 45° angle from each goal post. Further this arc area is divided into three parts by two straight lines at the each edge of the penalty arc as Right Angle, Left Angle and Central Angle, which is shown in the Fig. 8.

To start the test, the subject was asked to kick (shot) the ball, which was kept behind the shooting arc (20 yards), to the goal. Like this he was given a total of 10 kicks (3 kicks each from every angle and 1 kick from any of these three angles). The subject was permitted to use any part of his foot.
Fig. 8. Shooting in the Goal
Scoring: - 3 different points as 5, 3 & 1 were given according to the area where the ball went through, which is shown in Fig. 8. If, the ball hits the rope; the adjacent higher point was given. The total numbers of point from 10 successive kicks were recorded as the score of the subject.

18. Shooting a stationary ball in the goal (25 yards)

Same as Test No. 17, but in this test, the subject was asked to kick (shoot) in the goal from behind the shooting arc, which is 25 yards away from the goal.

19. Dribbling and Shooting in the Goal (20 yards)

Same as Test No. 17, but in this test, the subject was asked to dribble 2 to 3 yards and kick (shoot) in the goal from behind the shooting arc (20 yards).
20. Dribbling and Shooting in the goal (25 yards)

Same as Test No. 17, but in this test, the subject was asked to dribble 2 to 3 yards and kick (shoot) in the goal from behind the shooting arc (25 yards).

21. Receiving the Ball with Chest

**Purpose:** - To measure the ability of ball control in receiving by the chest.

**Facilities and Equipments:** - Soccer balls, measuring tape and marking for the test.

**Procedure:** - To start the test, a ball was tossed at 4 to 5 yards height approximately, from a serving line to the subject, who was standing 7 to 8 yards away from the serving line, and the subject received the ball with his chest. The distance between the places where the ball was received and the place where the ball had landed after the contact, was measured in the nearest half yards and given points according to that distance.
Instruction: - The server was asked to toss the ball at such a height and manner that the subject was able to received the ball comfortably.

If the subject was not satisfied with the height and manner of the served ball, he was permitted to take another chance. But once the ball had touched his chest, the trial was counted.

Scoring: - If, the area between the places where ball was received and landed was less than 0.50 yard (1.6 feet), 5 points was given, between 0.50 yard to 1 yard, 3 points and between 1 to 1.50 yards, 1 points were given. The total points of 10 trials was recorded.

22. Receiving a Rolling Ball with Foot

Purpose: - To measure the ability of ball control in receiving the foot.

Facilities and Equipments: - Soccer ball, measuring tape and marking for test.

Procedure: - A server started the test with passing a ball along the ground to the subject, who was standing 7 to 8 yards away from the serving line. The subject was permitted to receive the ball by any part of his foot. The distance between the place from where the ball was
received and the place where the ball rested after the rebound, was measured in the nearest half yards and given points according to that distance.

**Instruction:** - The server was asked to serve the ball in same speed and manner to all subjects as similar as he can. While receiving the ball the subject was not allowed to move backward. But he was allowed to move forward for receiving the ball.

**Scoring:** - If, the area between the places from where the ball was received and the ball rested after the rebound, was less than 0.50 yard (1.6 feet), 5 points was given, between 0.50 yard to 1 yard, 3 points and between 1 to 1.50 yards, 1 points were given. The total points of 10 trials were recorded.

### 23. Receiving a Bouncing Ball with Sole of the Foot

Same as Test No.21 (Receiving the ball with chest), but in this test, the subject trapped the ball with the sole of the foot just after the ball had rebounded from the ground.
24. Receiving an Aerial Ball with Foot

Same as Test No. 21 (Receiving the ball with chest), but here, the subject was asked to receive the ball with any part of his foot before the ball touched at the ground. The distance between the place from where the ball was received and the place where the ball rested after the contact was made, was measured and points were given accordingly.

25. Heading for Distance

**Purpose:** - To measure distance clearing ability by heading.

**Facilities and Equipments:** - Soccer balls, measuring tape and marking for the test.

**Procedure:** - A restraining line was drawn on one side of the ground as shown in Fig. 9.

The test began with tossing a ball at a height of 4 or 5 yards to the head of the subject who was standing 7 to 8 yards away. The ball was tossed at such a height and manner so that the subject could head the ball comfortably. The subject was asked to head the ball from
Fig. 9. Heading for Distance
behind the restraining line as far as he could. The distance from the restraining line to the spot where the ball landed, was measured and recorded in the nearest metres. 

**Instruction:** - If the subject did not satisfy with the height and manner of the ball, he was permitted to take another chance. But, once he touched the ball with his head, the trial was counted. The server was asked to serve the ball in same manner to all the subjects as similar as he could. The subject was permitted to take approach run or jump, so that he could apply maximum force. If the subject crossed the restraining line during the heading, the trial was retaken.

**Scoring:** - Measure the distance between the restraining line and the spot where the ball had landed and was recorded in nearest metres. The best of 3 trials was taken as the performance of each subject.

---

26. **Heading for Accuracy (10 yards)**

**Purpose:** - To measure the accuracy in heading.

**Facilities and Equipments:** - Soccer goal, Soccer Balls and markings of the test.
Procedure: - Three different size circles of 4 yards, 3 yards and 2 yards diameter with a common centre were drawn on the ground. At the centre of these three circles a flag posts was fixed so that the circles can be seen from a distant place. The area covered by the outer circle was the target of this test. 10 yards distance from the centre of this target, a line or mark was made as Heading Zone as shown in Fig. 10.

Tossing a ball at a height of 4 to 5 yards to the head of the subject who was standing 6 to 7 yards away began the test. Then subject was asked to head the ball to the target. Like this he was given 10 balls (trials).

Instruction: - If the subject did not satisfy with the height and manner of the ball, he was permitted to take another chance. But, once he touched the ball with his head, the trial was counted. The server was asked to serve the ball in same manner to all the subjects as similar as he could. If the subject crossed the restraining line during the heading, the trial was retaken. The ball was supplied from the sides also if the subject desired so.
Fig. 10. Heading for Accuracy
Scoring: - 3 different points as 5, 3 and 1 were given according to the place where the ball landed. Ball landed inside the inner circle including the circle line, 5 points, ball landed on the middle circle including the circle line, 3 points and ball landed on the outer circle including the circle line, 1 point were given. The total points for 5 trials was taken as the score of the subject.

27. Heading for Accuracy (12 yards)

Same as Test No. 26. But in this test the heading distance was 12 yards.

28. Feinting Between Flags

Purpose: - To measure the feinting ability.

Facilities and Equipments: - 4 Flag Posts, Stop watch and marking for the test.
Procedure: - Four flag posts were fixed in a line with a distance of 1 yard between two flag posts, as shown in Fig. 11. A Starting Line was drawn 5 yards away from the first flag post. And a Finishing Line was also drawn 5 yards away from the last flag post and parallel to the starting line.

At the command “go”, the subject was asked to run forward from the Starting Line and run through in and out of 4 flag posts and cross the Finishing Line with running. The time from the command “go” till he crossed the Finishing Line, was recorded.

Instruction: - If the subject missed any of the flag posts, he was asked to return and start again from that flag post and continue the course, otherwise the trial was retaken.

Scoring: - The best timing of 3 trials, recorded in the $\frac{1}{100}^{th}$ of a second. Further, the divisions of distance of this test item and best timing ($d_i$), was taken as the score of this test.
29. Tackling "One vs One" in Limited Area

Purpose: To measure the tackling ability.

Facilities required and procedure of this test is same as Test No. 34. But in this test, the point was given to the defender if he tackled away the ball from the defender within 30 seconds.

Facilities and Equipments: Soccer Balls.

Procedure: On the command "start", the subject was asked to keep the ball on the floor with repeated touches by any part of the body other than his hands and arms, till the ball touched the ground. The number of touches made with any part of the body was counted. Three trials were given.

Scoring: The number of touches for the best of 3 trials was recorded as the score of the subject. For scoring, following norms were followed:

Fig. 11. Feinting Between Flags
29. Tackling "One v/s One" in Limited Area

**Purpose:** To measure the tackling ability.

Facilities required and procedure of this test is same as Test No. 6. But in this test, the point was given to the defender if he tackled away the ball from the defender within 30 seconds.

30. Juggling

**Purpose:** - To measure the ball sense.

**Facilities and Equipments:** - Soccer Balls.

**Procedure:** - On the command “start”, the subject was asked to keep the ball in the air with repeated touches by any part of the body other than his hands and arms, till the ball touched the ground. The number of touches made with any part of the body was counted. 3 trials were given.

**Scoring:** - The number of touches for the best of 3 trials was recorded as the score of the subject. For scoring following norms were followed:
Below 05  - 0 point
05 to 09  - 1 point
10 to 14  - 2 points
15 to 19  - 3 points
20 to 24  - 4 points
25 to 29  - 5 points
30 to 34  - 6 points
35 to 39  - 7 points
40 to 44  - 8 points
45 to 49  - 9 points
50 & above - 10 points.

31. Repeated Wall Rebounds (5 feet)

Purpose: - To measure the ball sense.

Facilities and Equipments: - A wall or wooden board or a table (at least 1 yd wide and 1 yd high), soccer balls and marking for the test.

Procedure: - An area of 1 yd high and 1 yd long was drawn on a wall and a restraining line at least 2 yd long was drawn 5 ft away from this
wall, as shown in Fig. 12. Before starting the test subject was asked to stand behind this line with a soccer ball and a spare soccer ball was kept 5 feet behind this line (Restraining Line).

At the command “go”, the subject was asked to push or kick the ball against the wall either in the air or along the ground and let the ball be rebounded the ball back. After the ball rebounded back he was then asked to push or kick against the wall again, from the Restraining Line or behind the Restraining Line. Like this he was asked to continue for 30 seconds.

**Instruction:** - The tester was asked to count the number of successful and correct rebounds from the wall loudly, so that the subject can hear the number of rebounds (his scores). If the ball did not cross the line during pushing or kicking and the ball didn’t struck on the given area, the rebound is not counted. If the ball goes out of control he was allowed to use the spare ball, which was kept 5 feet behind the restraining line.
The numbers of successful and correct rebounds were recorded as the score. The best of 3 trials was recorded as the performance of the subject.

32. Repeated Wall Rebounds (7 feet)
Same as Test No. 31. But in this test the kicking distance was 7 feet.

Playing Ability Test

The soccer playing ability of the subjects was assessed by a panel of three experts who were technically qualified in coaching of soccer. All the experts were asked to give marks to the subjects according to their performance, from a maximum of hundred (100) points.

The evaluation was done by 3 experts, through observing the performance of the subjects in the real (actual) game situation.

Fig. 12. Repeated Wall Rebounds
Scoring: - The numbers of successful and correct rebounds were recorded as the score. The best of 3 trials was recorded as the performance of the subject.

32. Repeated Wall Rebounds (7 feet)

Same as Test No. 31. But in this test the kicking distance was 7 feet.

Playing Ability Test

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The evaluation was done by 3 experts, through observing the performance of the subjects in the real (actual) game situation.
Establishment of Validity, Reliability and Objectivity of the Test Items

Validity

Face validity was established for the test items, which have been chosen to form a test battery to serve as the criterion to measure specific playing ability test of soccer players.

All the 32 skill test items were selected on the basis the recommendation of experts and soccer coaches and information gained through available literature and their face values.

Face Values of All the Test Items

Shuttle Dribbling

In soccer, a player is supposed to face the opponent if he wants to face or beat him, whenever he is in dribbling situation. Therefore, for facing or beating the opponent, he has to change his direction of dribbling or running with ball with quick and fast action by sideward, forward and backward movements. Here, the test item "Shuttle Dribbling" is the modification of standard test "Shuttle Run"
developed by AAHPHER\(^1\), which is the test for measuring the agility of a person. So here, the player has to perform the shuttle run with the ball. This test might justify the evaluation of the dribbling agility of the player.

**WM Dribbling**

The procedure, which was mentioned in the Shuttle Dribbling, the test item "WM Dribbling" is the modification of standard test "WM Agility Run" which is the test for measuring the agility of the player. In the selected test item, the player has to dribble the ball in WM formation. This test might justify the evaluation of the dribbling agility of the player.

**30-yd and 40-yd Dribbling**

The selected test items 30-yd dribbling and 40-yd dribbling are the test items, which were the test items for measuring the speed

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ability of the player while dribbling. So these test items are the modifications of 30-yd and 40-yd dash, and here the player has to run for 30-yd or 40-yd with the ball. These tests might justify the evaluation of the speed ability in dribbling of the player.

Figure '8' Dribbling

The test item 'Figure '8' Dribbling' is same as the standard test "Zig-Zag Dribbling" developed by Warner\(^2\) which is the test item for measuring the dribbling ability of the player that is the ability of controlling the ball in dribbling. So, this test might justify the evaluation of the dribbling ability of the player.

Dribbling Against the Opponent

In soccer, a player is required to face the opponent if he wants dribble past the opponent or, wants to keep the ball under his control under the pressure of the opponent whenever he is in dribbling.

situation. Therefore, for beating the opponent or keeping the ball under his control while dribbling the ability of controlling the ball in dribbling is required. The test item “Dribbling Against the Opponent” is the test item for measuring the dribbling ability of the player while dribbling against the opponent. So, this test might justify the evaluation of the dribbling ability of the player.

Ground Pass and Aerial Pass

All the test items selected for ground pass and aerial pass are the test items, which measures the passing accuracy of the player. The meaning of ‘accuracy’ is ‘the quality of being exact’ and here the meaning of accuracy is how perfectly the ball has been passed (given) to a target. The followings are the test items of ground pass and aerial pass –

(a) Ground Pass:

1. Ground pass a stationary ball (15 yds)
2. Ground Pass a stationary ball (20 yds)
3. Dribbling and ground pass (15 yds)
4. Dribbling and ground pass (20 yds)

(b) Aerial Pass:

1. Aerial pass a stationary ball (20 yds)
2. Aerial Pass a stationary ball (25 yds)
3. Dribbling and Aerial pass (20 yds)
4. Dribbling and Aerial pass (25 yds)

So, the selected test items might justify the evaluation of accuracy in ground pass and aerial pass of the player.

Kicking or Heading for Distance

The selected test item of 'Kicking for Distance” and “Heading for distance” are the test which measures the kicking power or heading power of the player in the terms of the distance the ball is kicked or headed by the player. Following are the test items for kicking for distance and heading for distance –

(a) Kicking for distance:

1. Kicking a stationary ball for distance
2. Dribbling and kicking for distance
(b) Heading for distance:

1. Heading for distance

So, the selected test items might justify the evaluation of kicking for distance and heading for distance of the player.

Shooting in the Goal

The selected test items of "Shooting in the Goal" are the test items, which measures ability of the players to shoot the ball in goal accurately. In these test items the target areas for shooting the ball were made inside the goal by dividing the goal in different point areas/zones and the players were asked to shoot the ball in the highest point target area of the goal. Following are the test items for shooting in the goal –

1. Shooting a stationary ball in the goal (20 yds)
2. Shooting a stationary ball in the goal (25 yds)
3. Dribbling and shooting in the goal (20 yds)
4. Dribbling and shooting in the goal (25 yds)
So, the selected test items might justify the evaluation of accuracy of shooting in the goal of the player.

**Receiving the Ball**

The selected test items for “Receiving the Ball” are the test items for measuring control over the ball during receiving that was given or passed by other player either in air or ground or with a bounce. Following are the test items for kicking for distance –

1. Receiving the ball with chest
2. Receiving a rolling ball with foot
3. Receiving a bouncing ball with sole of the foot
4. Receiving an aerial ball with foot

So, the selected test items might justify the evaluation of receiving the ball of the player.

**Heading for Accuracy**

The selected test items of “Heading for Accuracy” are the test items, which measures ability of the players to head the ball
accurately. In these test items the target areas for heading the ball were made on the ground by making three different intra-circular point areas and the players were asked to head an aerial ball in the highest point target area of the goal (inner circle). Following are the test items for shooting in the goal –

1. Heading for accuracy (10 yds)
2. Heading for accuracy (12 yds)

So, the selected test items might justify the evaluation of heading for accuracy of the player.

Feinting Between Flags

The selected test item “Feinting Between Flags” is the test item for measuring the feinting ability of the player. In this test item the player was asked to run and feint by using footwork through a series of flags.

So, the selected test item might justify the evaluation of feinting ability of the player.
Tackling ‘One v/s One’ in Limited Area

The selected test item “Tackling ‘One v/s One’ in Limited Area” is the test item for measuring the ball tackling ability of the player. Ball tackling is the ability of snatching away the ball or sending away the ball from the opponent or ability of facing the opponent by not being beaten by the opponent with the ball. In this test the player was asked to tackle (snatch away) the ball from the opponent or face an opponent player in a limited area and within a given time.

So, the selected test item might justify the evaluation of ball tackling ability of the player.

Ball Sense

The selected test items for “Ball Sense” are the test items for measuring the control over the ball under any situation. Following are the test items for shooting in the goal –

1. Juggling

2. Repeated wall rebounds (5 ft)
3. Repeated wall rebounds (7 ft)

So, the selected test items might justify the evaluation of ball sense of the player.

**Reliability**

Reliability of tests was established by test-retest process whereby consistency of results was obtained by Product Moment Correlation. The data collected from ten (10) subjects in test-retest, were computed for each variable and correlations obtained have been presented in Table 2.
Table 2

RELIABILITY CO-EFFICIENT OF TEST-RETEST SCORES
OF ALL THE SKILL TEST ITEMS

<table>
<thead>
<tr>
<th>Test Items</th>
<th>Co-efficient of Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Shuttle Dribbling</td>
<td>0.84*</td>
</tr>
<tr>
<td>2. WM Dribbling</td>
<td>0.80*</td>
</tr>
<tr>
<td>3. 30-yard Dribbling</td>
<td>0.77*</td>
</tr>
<tr>
<td>4. 40-yard Dribbling</td>
<td>0.86*</td>
</tr>
<tr>
<td>5. Figure &quot;8&quot; dribbling</td>
<td>0.77*</td>
</tr>
<tr>
<td>6. Dribbling against the opponent</td>
<td>0.70*</td>
</tr>
<tr>
<td>7. Ground pass a stationary ball (15-yds)</td>
<td>0.72*</td>
</tr>
<tr>
<td>8. Ground pass a stationary ball (20-yds)</td>
<td>0.69*</td>
</tr>
<tr>
<td>9. Dribbling and Ground pass (15-yds)</td>
<td>0.72*</td>
</tr>
<tr>
<td>10. Dribbling and Ground pass (20-yds)</td>
<td>0.70*</td>
</tr>
<tr>
<td>11. Aerial pass a stationary ball (20-yds)</td>
<td>0.74*</td>
</tr>
<tr>
<td>12. Aerial pass a stationary ball (25-yds)</td>
<td>0.71*</td>
</tr>
<tr>
<td>13. Dribbling and aerial pass (20-yds)</td>
<td>0.77*</td>
</tr>
<tr>
<td>14. Dribbling and aerial pass (25-yds)</td>
<td>0.79*</td>
</tr>
<tr>
<td>Test Items</td>
<td>Co-efficient of Correlation</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------</td>
<td>----------------------------</td>
</tr>
<tr>
<td>15. Kicking a stationary ball for distance</td>
<td>0.88*</td>
</tr>
<tr>
<td>16. Dribbling and kicking for distance</td>
<td>0.82*</td>
</tr>
<tr>
<td>17. Shooting a stationary ball in the goal (20-yds)</td>
<td>0.70*</td>
</tr>
<tr>
<td>18. Shooting a stationary ball in the goal (25-yds)</td>
<td>0.73*</td>
</tr>
<tr>
<td>19. Dribbling and shooting in the goal (20-yds)</td>
<td>0.67*</td>
</tr>
<tr>
<td>20. Dribbling and shooting in the goal (25-yds)</td>
<td>0.70*</td>
</tr>
<tr>
<td>21. Receiving the ball with chest</td>
<td>0.90*</td>
</tr>
<tr>
<td>22. Receiving a rolling ball with foot</td>
<td>0.89*</td>
</tr>
<tr>
<td>23. Receiving a bouncing ball with sole of the foot</td>
<td>0.84*</td>
</tr>
<tr>
<td>24. Receiving an aerial ball with foot</td>
<td>0.79*</td>
</tr>
<tr>
<td>25. Heading for distance</td>
<td>0.80*</td>
</tr>
<tr>
<td>26. Heading for accuracy (10-yds)</td>
<td>0.71*</td>
</tr>
<tr>
<td>27. Heading for accuracy (12-yds)</td>
<td>0.70*</td>
</tr>
<tr>
<td>28. Feinting between flags</td>
<td>0.79*</td>
</tr>
<tr>
<td>29. Tackling &quot;one v/s one&quot; in limited area</td>
<td>0.67*</td>
</tr>
</tbody>
</table>
Table 2 (Contd.)

<table>
<thead>
<tr>
<th>Test Items</th>
<th>Co-efficient of Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>30. Juggling</td>
<td>1.00*</td>
</tr>
<tr>
<td>31. Repeated wall rebounds (5 feet)</td>
<td>0.78*</td>
</tr>
<tr>
<td>32. Repeated wall rebounds (7 feet)</td>
<td>0.84*</td>
</tr>
</tbody>
</table>

* Significant at .05 level. $r_{0.05}(8) = 0.765$, $(N = 10)$

From Table 2, it is evident that tester reliability was significantly high thus establishing the competency of the scholar to administer the test.

**Objectivity**

The objectivity of tests was established by correlating (using Product Moment Correlation formula) the two sets of test scores conducted by two testers, the research scholar and a football coach on the same 10 subjects and correlations obtained have been presented in Table 3.
**Table 3**

**OBJECTIVITY CO-EFFICIENT OF CORRELATION OF ALL THE SKILL TEST ITEMS**

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<td>4. 40-yard Dribbling</td>
<td>0.79*</td>
</tr>
<tr>
<td>5. Figure &quot;8&quot; dribbling</td>
<td>0.83*</td>
</tr>
<tr>
<td>6. Dribbling against the opponent</td>
<td>1.00*</td>
</tr>
<tr>
<td>7. Ground pass a stationary ball (15-yds)</td>
<td>1.00*</td>
</tr>
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</tr>
<tr>
<td>14. Dribbling and aerial pass (25-yds)</td>
<td>1.00*</td>
</tr>
<tr>
<td>15. Kicking a stationary ball for distance</td>
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* Significant at .05 level. $r_{.05} (8) = .765, (N = 10)$

From Table 3, it is evident that the objectivity of all the test items was significantly high thus establishing the competency of the scholar to administer the test.

**Statistical Procedure**

This part of the procedure is devoted to discuss the statistical procedure used to develop the specific soccer playing ability test on the basis of skill tests from the data collected from 108 soccer players.

The design of the study was to construct specific soccer playing ability test for the 15 to 19 years age groups.
So, the first method of statistical analysis was Pearson’s Product Moment Correlation\(^3\) which was used to find out the relationship of all skill test items with playing ability in soccer.

Secondly, Factor analysis technique was used as a tool to select the best-suited skill test items. The Factor Analysis was applied by using the Principal Component Analysis (Unrotated Factor Loadings and Varimax Rotation). Final solution so obtained was used to identify the different factors. These factors were given an appropriate name depending upon the characteristics of variables contained in it. Finally, a Skill Test Battery for measuring the playing ability, was prepared by picking up variables having the highest loading from each factor.

Finally, for the interpretation of playing ability performance scores, Hull Scale method for developing a norm and 6-Sigma Scale\(^4\) method for developing a Grading Scale, were used.

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